



New record of *Adelphicos daryi* (Serpentes: Dipsadidae) after 19 years, and additional record of *Ptychohyla euthysanota* (Anura: Hylidae) in Guatemala

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Abstract.—New records of the Endangered *Adelphicos daryi* (Serpentes: Dipsadidae) and Near Threatened *Ptychohyla euthysanota* (Anura: Hylidae) are reported for the Department of Guatemala, Guatemala City. Brief comments on local conservation concerns for these two species are presented.

Keywords. Amphibia; Central America; Endangered; new records; Reptilia

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Snakes of the genus *Adelphicos* are small (39–57 cm) and secretive leaf litter inhabitants of rainforest, cloud forest, and pine-oak and conifer forest habitats, and they range from northern Mexico (Tamaulipas) to western Honduras (Campbell and Ford 1982; Kholer 2008). Six species of *Adelphicos* are registered for Guatemala. Within this genus, *Adelphicos daryi* was described by Campbell and Ford in 1982, based on 11 specimens reported from San Jorge Muxbal, Department of Guatemala, Guatemala (Campbell and Ford 1982).

The IUCN Red List classifies *Adelphicos daryi* as Endangered due to its very restricted distribution in the central Guatemalan highlands. The species is terrestrial, fossorial, and mainly nocturnal (Acevedo et al. 2014). Prior to the report made in this paper, there were five known localities for this species based on many records all within the Department of Guatemala: San Jorge Muxbal (type locality), Villa Canales and Las Joyas, Santa Catarina, Pinula; Km 14.5 carretera a El Salvador, Puerta Parada; Vista Hermosa III, Universidad Rafael Landivar, Zona 15, and San Rafael, carretera a El Salvador (Table 1) [J. Campbell, pers. comm. 2019].

The genus *Ptychohyla* includes frogs that inhabit broad-leaf and mixed pine forest, with six species recognized in Central America (Faivovich et al. 2018). There are six species vouchered for Guatemala, including *Ptychohyla euthysanota* (Kellogg, 1928). The IUCN Red List classifies *Ptychohyla euthysanota* as Near

Threatened because its distribution is not much greater than 20,000 km² (Santos-Barrera et al. 2010).

Observations

During a nocturnal photography hike in the Río Las Monjas on 11 July 2017 at 2100 h, the junior author observed a snake alongside a large rock. It was initially believed to be *Stenorrhina freminvillei*. However, following more careful examination of the living specimen, it was photographed (Fig. 1), and the images were forwarded to Jonathan Campbell of the University of Texas at Arlington for identification purposes. Dr. Campbell confirmed that the specimen was *Adelphicos daryi*. This record represents a new location for the Department of Guatemala: Guatemala City, zona 16, Río Las Monjas; 14.6075°N -90.463055°W (WGS84), 1,530 m asl (Fig. 2). Although this site is not a great distance from the previous reported localities (Table 1), it has been 19 years since the last confirmed report of this species from Km 14.5 Carretera a El Salvador, Puerta Parada.

The same night, the senior author observed a male of *Ptychohyla euthysanota* calling from a small shrub beside the Río Las Monjas at 2244 h (Fig. 3). This observation and photographic confirmation are separated by 21.25 km airline from the nearest prior record of this species in the Lago de Amatitlán (based on IUCN Records) [Fig. 4].

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Conservation Concerns

Unfortunately, these new records for *Adelphicos daryi* and *Ptychohyla euthysanota* both occur in an unprotected area in Guatemala City. Access to the new locality is restricted in some parts for urban settlements, while for other parts the access is easy, and some local people still extract firewood from this area. The major threats that *Ptychohyla euthysanota* currently faces are alteration or loss of original habitats due to agricultural activity, logging (Santos-Barrera et al. 2010), and the pollution of water bodies where they breed (Fig. 5). Another threatened amphibian has previously been recorded at this locality, *Plectrohyla guatemalensis*, which is classified by the IUCN as Critically Endangered. Conservation efforts need to be improved in this area, in order to safeguard this endemic snake and regionally endemic frog. These efforts should work with the communities, to promote the creation of a comprehensive national water law, and reduce deforestation (Acevedo et al. 2014).

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Literature Cited

- Acevedo M, Ariano-Sánchez D, Johnson J. 2014. *Adelphicos daryi*. *The IUCN Red List of Threatened Species* 2014: e.T521A3014000.
- Campbell JA, Ford LS. 1982. Phylogenetic relationships of the colubrid snakes of the genus *Adelphicos* in the highlands of Middle America. *Occasional Papers of the Museum of Natural History University of Kansas* 100: 1–22.
- Faivovich J, Pereyra MO, Luna MC, Hertz A, Blotto BL, Vásquez-Almazán CR, Köhler G. 2018. On the monophyly and relationships of several genera of Hylini (Anura: Hylidae: Hylinae), with comments on recent taxonomic changes in hylids. *South American Journal of Herpetology* 13(1): 1–32.
- Köhler G. 2008. *Reptiles of Central America*. 2nd Edition. Herpeton-Verlag Elke Köhler, Offenbach, Germany. 400 p.
- QGIS Development Team. 2020. QGIS Geographic Information System. Open Source Geospatial Foundation Project. Available: <http://qgis.osgeo.org> [Accessed: 3 June 2019].
- Santos-Barrera B, Acevedo M, Muñoz Alonso A. 2010. *Ptychohyla euthysanota*. *The IUCN Red List of Threatened Species* 2010: e.T55910A11388786.



Fig. 1. Individual of *Adelphicos daryi* in life. (A) Ventral view and (B) dorsal pattern of the specimen; (C) comparison of the size of the head with author's thumb; (D) lateral view of the head. Photos by Fred Muller.

Distribution of *Adelphicos daryi* in Guatemala.

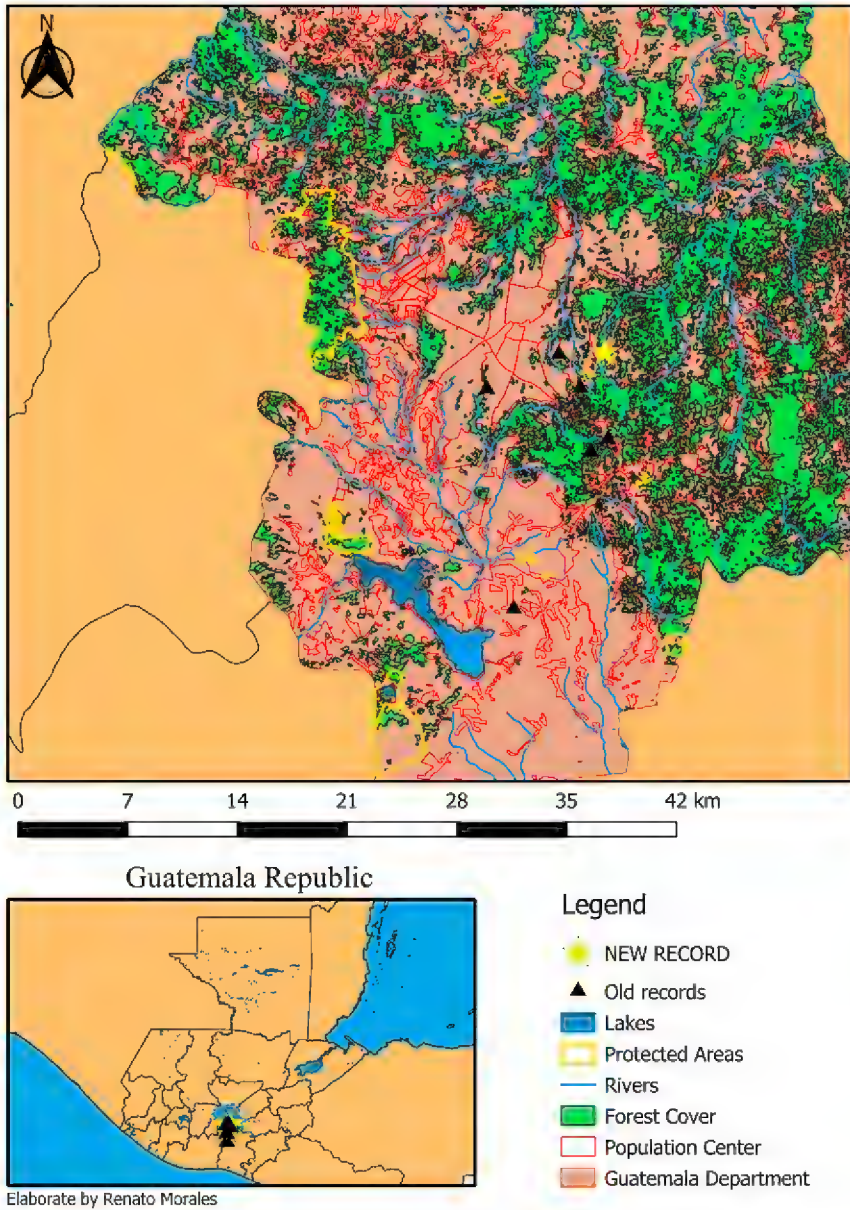


Fig. 2. Map of the distribution of *Adelphicos daryi* in Guatemala. Yellow star: new record; black circles: previous records; brown area: Guatemala Department. The map was developed with QGIS software (QGIS Development Team 2020).

Distribution of *Ptychohyla euthysanota* in Guatemala.

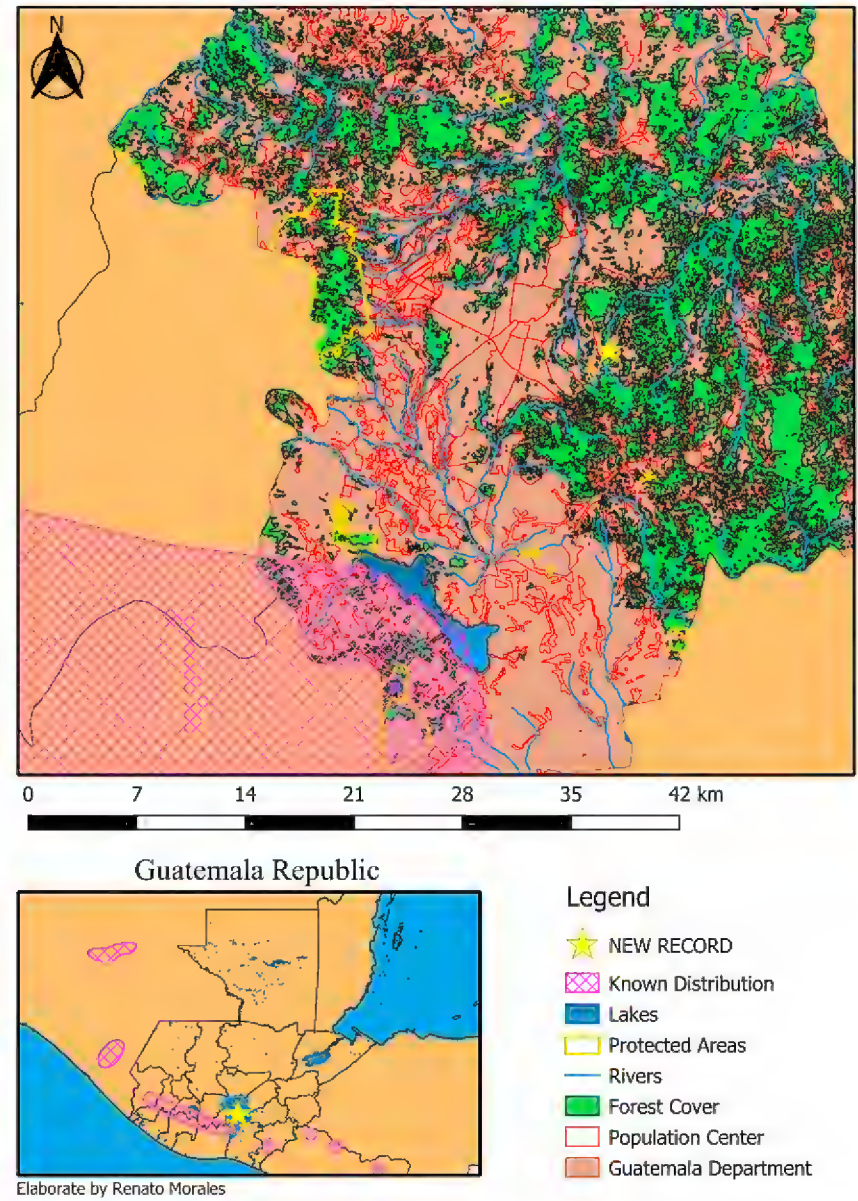


Fig. 4. Map of the distribution of *Ptychohyla euthysanota* in Guatemala. Yellow star: new record; purple polygons: previous records; brown area: Guatemala Department. The map was developed with QGIS software (QGIS Development Team 2020).

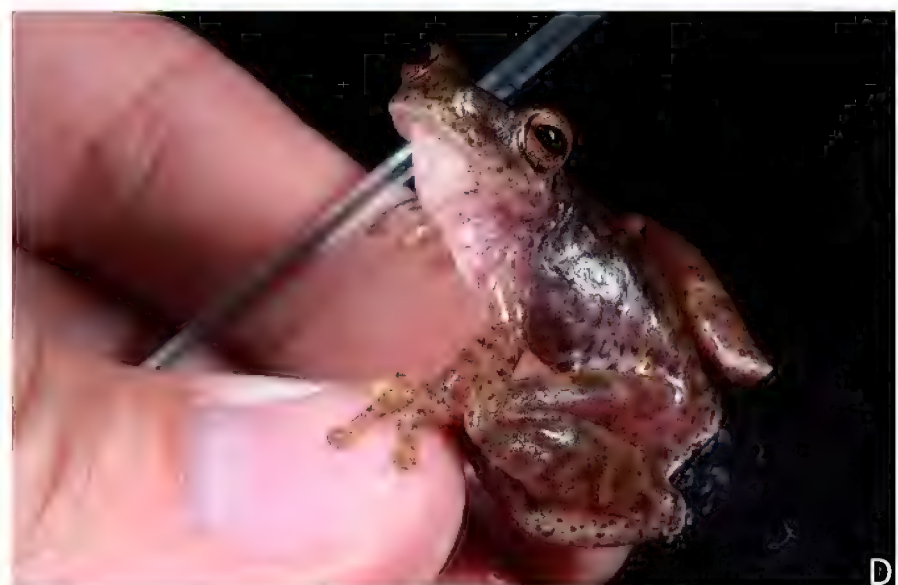
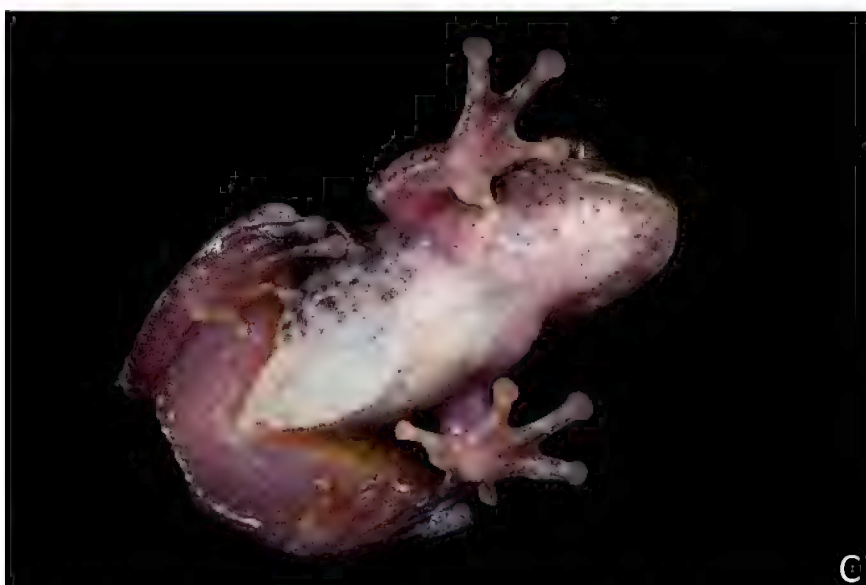


Fig. 3. Male of *Ptychohyla euthysanota* in life. (A) Lateral, (B) frontal, (C) ventral, and (D) lateral views of the specimen. Photos by Renato Morales (A–B) and Fred Muller (C–D).

New records of *Adelphicos daryi* and *Ptychohyla euthysanota*

Table 1. Historical and new records of *Adelphicos daryi* for Guatemala. UTA: University of Texas Arlington; UVGR: Universidad del Valle de Guatemala.

	Voucher	Locality	Latitude	Longitude	Capture date
Previous records	UVGR 2575	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	1980
	UVGR 1131	Km 14.5 carretera a El Salvador, Puerta Parada, frente a Iglesia Sn. Francisco	14.5575	-90.4611	1984
	UVGR 1088	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	1987
	UVGR 1376	Km 14.5 carretera a El Salvador, Puerta Parada, frente a Iglesia Sn. Francisco	14.5575	-90.4611	4 May 1975
	UVGR 1389	Km 14.5 carretera a El Salvador, Puerta Parada, frente a Iglesia Sn. Francisco	14.5575	-90.4611	4May 1975
	UVGR 246	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	13 Dec 1979
	UVGR 3	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	6 Nov 1980
	UVGR 226	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	2 Jul 1982
	UVGR 380	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	30 May 1984
	UVGR 1194	Km 14.5 carretera a El Salvador, frente a Iglesia San Francisco	14.5575	-90.4611	13 Aug 1984
	UVGR 1197	Km 14.5 carretera a El Salvador, Puerta Parada, frente a Iglesia Sn. Francisco	14.5575	-90.4611	27 Sep 1984
	UVGR 535	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	10 Apr 1985
	UVGR 1508	Km 14.5 carretera a El Salvador, Puerta Parada, frente a Iglesia Sn. Francisco	14.5575	-90.4611	1 Aug 1990
	UVGR 1844	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	24 Apr 1991
	UVGR 1845	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	24 Jun 1991
	UTA 32950	Villa Canales, Villa Tapacon, Quebrada Norte			12 May 1992
	UVGR 1991	zona 15, Vista Hermosa III, Universidad Rafael Landivar	14.6065	-90.4901	27 Aug 1992
	UVGR 1840	zona 10, Colonia El Prado	14.5864	-90.5328	21 Sep 1992
	UVGR 2023	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	8 Nov 1992
	UVGR 2032	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	15 Jul 1994
	UVGR 2033	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	10 Sep 1994
	UVGR 2872	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	10 Sep 1994
	UVGR 3084	San Rafael, carretera a El Salvador	14.3333	-90.5167	28 Oct 1994
	UTA 39216	Santa Catarina Pinula, San Miguel Buena Vista (Las Joyas)			11 Nov 1994
	UVGR 2059	Km 14.5 carretera a El Salvador	14.5575	-90.4611	2 Jul 1995
	UVGR 2142	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	8 Dec 1995
UVGR 2356	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	15 May 1997	
UVGR 2355	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	8 Oct 1997	
UVGR 2809	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	5 Mar 1998	
UVGR 2572	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	No data	
UVGR 2741	Km 14.5 carretera a El Salvador, Puerta Parada	14.5575	-90.4611	No data	
New Record	No voucher	Río Las Monjas, Zona 16, Guatemala City	14.6075	-90.463055	11 Jul 2017

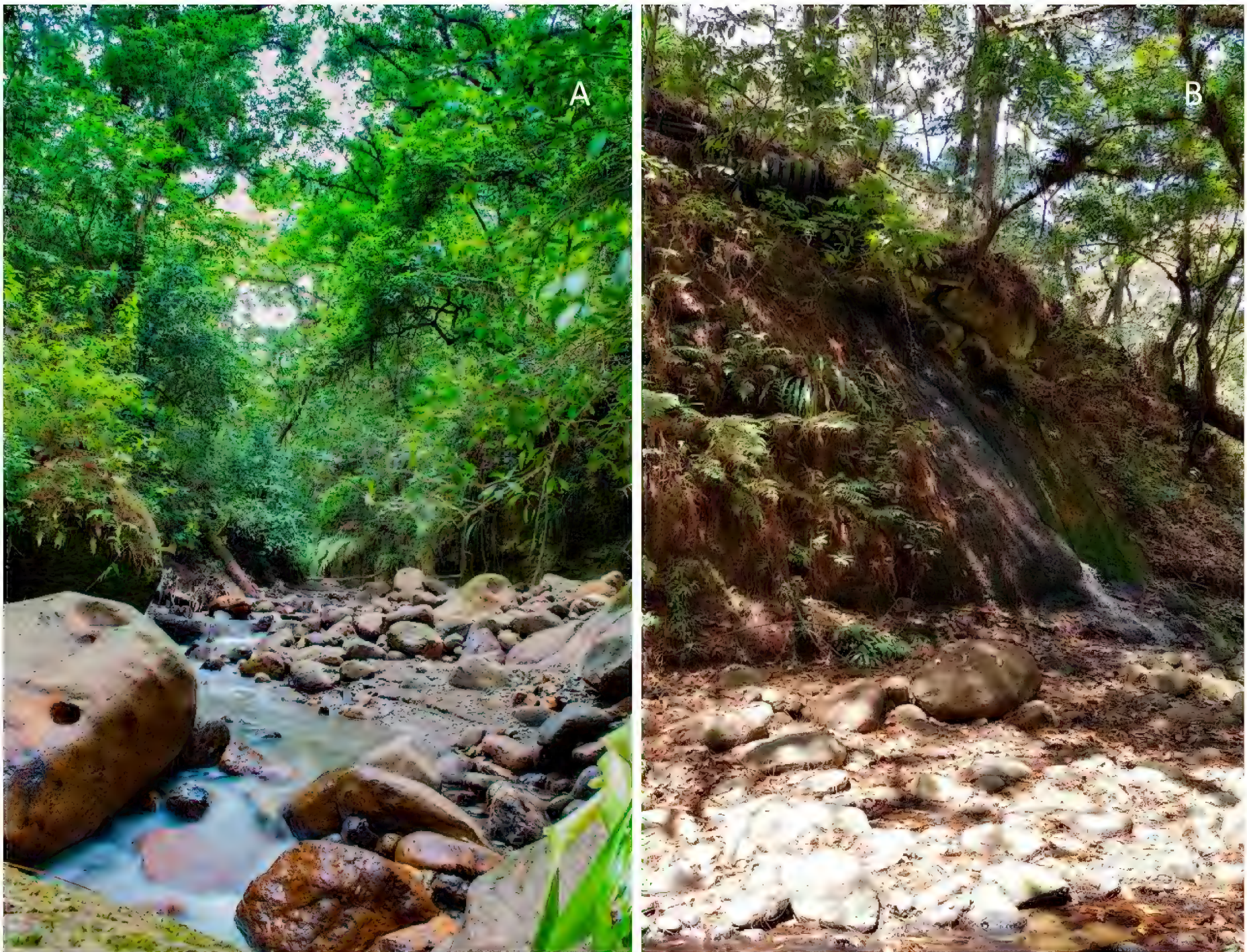


Fig. 5. Río Las Monjas, Zona 16, Guatemala City. **(A)** Habitat for *Adelphicos daryi* and *Ptychohyla euthysanota*; **(B)** Pollution of the waterbody by drainage.



Renato Morales is a Guatemalan biologist and herpetologist, and amateur wildlife photographer. He has been learning about and working on amphibians and reptiles in Guatemala since 2013. Renato served as a teaching assistant in evolution courses, and director of geology and paleontology courses, at the Universidad de San Carlos de Guatemala; and he belongs to the group of taxonomists of the National Council for Protected Areas (CONAP). In 2019, he was invited to the IUCN Red List Workshop as part of the Guatemalan amphibian specialist group, and he is currently working on the genetics of lizards and the conservation of salamanders and frogs.



Fred Muller has had a lifelong interest in natural history and began his career as a nature photographer, specializing in botany, with a post at the Lyon Botanical Garden in France. He worked there as staff photographer from 2002 to mid-2007, when he moved to Guatemala. Since then, Fred has worked as an ecotourism guide and nature photographer specializing in Mesoamerican biodiversity. His current topics of interest include the region's most endangered flora and herpetofauna. Fred has accumulated a substantial collection of unique portraits of plants and animals, and his photography has been showcased in many scientific publications as well as in public showings. Recently, his photographs have appeared on websites such as *Exotica Esoterica* (<http://www.exoticaesoterica.com>) where he is an author and photographer. Many examples of his work can be seen on his Flickr page (<http://www.flickr.com/photos/fredmullerpix>) as well as at *Aroid Pictures* (<http://www.aroidpictures.fr>).